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17 August 1978

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TRANSLATIONS ON EASTERN EUROPE

SCIENTIFIC AFFAIRS

No. 597

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CONTENTS PAGE

COOPERATION IN PRODUCTION OF NUMERICALLY CONTROLLED MACHINE TOOLS

Budapest NEPSZAVA in Hungarian 21 Jul 78 p 3

[Text] A new type of NC machine tool has been developed through cooperation between the Machine Tool Industry Works of Hungary and the Lemz Elektrotechnika Factory of the Soviet Union. Named the Sovimag 630, its cooperative production began once development had been completed. The automatic elements of the equipment are made by the Machine Tool Industry Works while the Lemz Factory provides several components of this new revolving lathe. This is the first case of cooperation between the socialist countries involving production of NC machines. A 2,000 square meter plant has been completed at the Nyirbator factory unit of the Csepel Works' Machine Tool Factory. Production will begin at the end of this year at this establishment which cost 200 million forints.

The two latest events in the machine tool industry indicate that this branch is making an effort to produce highly accurate, automated products after discontinuing production of obsolete types of machinery. Numerous measures have been taken in the interest of disseminating numerical control.

We participate in joint planning within CEMA. The member nations coordinated reciprocal shipment of 2,600 NC machine tools and 26,000 complete components for 119 types of machine tools during the Fifth Five-Year Plan. Under the terms of a 4-year agreement between Technoimpex of Hungary and Stankoimport of the USSR, there will be a reciprocal shipment of machine tools worth more than 27 million rubles between 1977-1980. In the interest of raising technical standards, fruitful relations have been established with various Western firms. The Machine Tool Industry Works began by purchasing a French license; more recently cooperation has been established with a West German firm.

A computerized, numerically controlled processing center represented the achievements of the Hungarian machine tool industry at the latest Hannover Fair. So-called CNC technology has been in use barely more than 2 or 3 years. It was initially developed by Japanese, West German and U.S. firms. So far Hungary has developed three different kinds of CNC techniques. These were evolved at the Electrical Automation Institute [Villamos Automatikai Intezet],

MORE DETAILS ON BULGARIAN PARTICIPATION IN 'INTERKOSMOS' PROGRAM

Sofia NARODNA MLADEZH in Bulgarian 7 Jul 78 p 2

[Article by Professor Dimitur Mishev, deputy chairman of the National Committee for the Study and Utilization of Outer Space: "Bulgarian Science and Space Research"]

[Text] It is a known fact that the Bulgarian People's Republic founded the "Interkosmos" program in 1967, rallying the efforts of nine socialist countries for the study and utilization of outer space. We are actively participating in the five basic types of "Interkosmos" activities: space physics, space meteorology, satellite communications, space biology and medicine, and remote control methods for the study of the earth from outer space.

I shall discuss some aspects of the development of space research in our country.

Immediately after the launching of the first Soviet manmade satellite of earth, on 4 October 1957, Bulgaria undertook intensive studies of satellites through optical and radio observations. Ionospheric studies were intensified and scientific workers were trained for outer space measurements. It was on the basis of a Bulgarian assignment that the USSR made equipment for the Interkosmos-2 satellite, in 1969, while Bulgarian specialists participated in the formulation of the program and the study of the results of the measurements taken aboard the Soviet Kosmos-261 and Kosmos-348 satellites, in 1968 and 1970 respectively.

The Interkosmos-8 satellite, carrying Bulgarian equipment aboard, used to measure electron and ion concentrations and electron and ion temperatures through the Langmuir probe and spherical ion collectors, was launched on the eve of 2 December 1972. Many new and interesting scientific results were obtained on the planetary breakdown of electron and ion concentrations and temperatures. In accordance with the United Nations classification, Bulgaria became the 18th space country. Bulgarian instruments worked impeccably and yielded numerous and interesting scientific results aboard the Interkosmos-12 and Interkosmos-14 satellites as well. Bulgarian scientific equipment was also present aboard the heavy geophysical Vertikal rockets and a number of meteorological rockets.

The programs of the experiments included the following:

Receiving images of the earth's surface in the various spectral zones and at different levels of radiation polarization;

Synchronous ground studies on standard sectors in Bulgaria using the specialized ground set developed by the Central Laboratory for Space Research of the Bulgarian Academy of Sciences.

The experimental data are used on a comprehensive basis by a number of institutes and establishements in our country. Valuable results have been obtained in the fields of geology, geomorphology, soil science, agriculture and forestry, environmental pollution, and others.

The equipment for synchronous experimentation with aircraft and satellites, developed by Bulgarian scientists, have operated successfully in a number of socialist countries such as the USSR, Czechoslovakia, Poland, and Cuba. The fact that the instrument ISOKh-20 developed by the Bulgarian Academy of Sciences, made possible ground measurements in the USSR, Poland, Cuba, and Bulgaria, in the course of the flight of the first Polish cosmonaut, was of particular importance.

A number of valuable data were obtained as a result of the space photographs of our country taken from the Salyut-4, Salyut-5, and Salyut-6 orbital stations.

On the basis of these briefly enumerated successes in the study and use of outer space a number of Bulgarian scientific institutes and scientists prepared programs for the experiments to be conducted by Bulgarian cosmonauts aboard the Salyut-Soyuz Orbital Scientific Research Complex. These will include, above all, experiments of great scientific and practical value not only to our science but to all socialist countries. The extensive discussion of such experiments in our country and within the framework of cooperation based on the Interkosmos program confirmed the significance of the earmarked program whose implementation is awaited with great interest not only by Bulgarian scientific workers but by scientists in all socialist countries.

5003
CSO: 2202

coatings assure high corrosion resistance and good external product appearance.

The Central Laboratory of Electrochemical Current Sources has developed a new technique for protective tubes for the "positive" plates in lead batteries using nonwoven textile methods. The tubes that are produced have great operating strength, and moreover the need for them is growing at an accelerated rate. The new nonwoven-textile protective tubes are successfully replacing the previous ones made of woven textile. The introduction of the technique will bring an economic savings of about 300,000 leva to the national economy.

The Joint Earth Sciences Center has developed a new type of emulsion liquid for hydraulic sandstone fracturing. It is an acid emulsion liquid and is used for working high-temperature petroleum soundings. The emulsion has quite high stability and low corrosive activity -- indices which make possible deep working of a reservoir. Through the introduction of the new emulsion, cleaning out of the reservoir will be achieved, as well as an increase in its filtration capacity, and hence more additional quantities of extracted oil. The economic effect from the introduction of the new emulsion in the Dolni Dubnik oil field has contributed nearly 20,000 more tons of oil to the national economy.

Institute of Water Problems: Invention No. 21707, "A Device for the Pneumatic Conveyance of Bulk Materials," has been created and introduced. The innovation makes possible more efficient short-distance conveyance of dry bulk materials such as cement, flour, sand, grain, synthetic fertilizers etc.

In addition, it makes it possible to effect the emptying of hoppers and the charging of trunk pipelines. The invention will find wide use in the field of scientific research on the processes that take place in pipelines during the conveyance of low- and high-concentration air mixtures.

Central Laboratory of Higher Geodesy: Invention No. 31433, "A Device for Eccentric Measurements with Geodetic Instruments," has been created and introduced. With it the necessary eccentric observations can be made with one-time centering and leveling. This facilitates geodetic work, increases precision and avoids some errors. The invention makes it possible to lower the cost of constructing and assembling high objects.

The same laboratory has created and introduced invention No. 28854, "A Theodolite for the Measurement and Layout of Vertical Angles and Elevations." It makes it possible to expand the field of application of certain geodetic instruments, increase precision and facilitate geodetic operations. The invention is finding wide use in the field of geodesy, the construction of athletic arenas, tunnels, bridges, dams etc.

6474
CSO: 2202

TASKS, JURISDICTION, OPERATION OF SCIENCE POLICY COMMITTEE SET FORTH

Budapest MAGYAR KOZLONY in Hungarian No 36, 1978 pp 381-383

/Article by Gyorgy Lazar, chairman of the Council of Ministers/

/Text/Resolution No 1016/1978 (VI.10.) of the Council Of Ministers regarding the scope of duties, sphere of authority and operation of the Science Policy Committee.

I.

1. The Science Policy Committee (hereafter referred to as the Committee) is a governmental committee established by the Council of Ministers; the Council of Ministers is responsible for the Committee's activities and decisions.

2. According to the principles and sphere of competence determined by the Council of Ministers, the Committee has as its tasks the development and theoretical direction of science policy, the organized harmonization of the state direction of scientific research and technical development, participation in the scientific foundation of sociological and economic policy decisions, the promotion of the practical utilization of scientific knowledge and research results and the determination of the principles, main objectives and directions of the development of international scientific relations.

II.

3. Prior to submission before the Council of Ministers, the Committee discusses and gives an opinion on:

a. proposals dealing with overall sociological and economic policy questions also of importance from a science policy viewpoint;

b. the national long- and medium-range research development draft plan and the national research development tasks included and to be included in it;

j. takes a position, or rather gives an opinion on matters of the establishment, merger and elimination of higher education level institutes and of their important educational and research organizational units;

k. takes a position on matters of the developmental goal of large investments serving research and development and higher education activities, and the science policy justification of the important investments belonging to this subject matter;

l. exercises control over the subcommittee, the Social Science Coordination Committee, whose task is to participate in the direction and harmonization of social science researches; approves the order of business, work plan and positions of its subcommittee;

m. decides the distribution of the financial resources at tis disposal;

n. supervises the implementaion of the resolutions passed by requesting reports, giving assignments to individual organs or by other means.

5. The Committee:

a. within the framework of its cooperation with the State Plan Committee:

--discusses and evaluates, from a science policy viewpoint, individual concepts dealing with overall questions of social and economic development, providing the basis of national economic plans of various ranges, also important from a science policy viewpoint, as well as the research and development part of the medium-range national economic plan concept, or rather draft plan;

--follows closely the fullfillment of the research and technical development tasks established in the framwork of the central development programs, and gives an opinion from a science policy viewpoint about proposals related to new central development programs;

--promotes the harmonization of the medium-range national economic plan and of the research and development plans;

b. in the framework of the cooperation taking place with the International Economic Relations Committee:

--takes position in determining the main directions and tasks of scientific technical international cooperation.

III.

6. The chairman of the Committee is the deputy chairman of the Council of Ministers entrusted with this responsibility. The deputy chairman of

8. The Committee itself determines its order of business, work schedule and control plans, which are approved by the Council of Ministers.

9. The coordination, organizational and administrative tasks related to the operation of the Science Policy Committee are performed by the work organ of the Committee, the Secretariat. The Secretariat maintains work relations with the interested ministries and organs with nationwide jurisdiction. Organically, the Secretariat of the Committee operates in the framework of the Secretariat of the Council of Ministers. The funds necessary for its operation must be provided for in the budget of the Secretariat of the Council of Ministers.

10. This resolution goes into effect on the day of its promulgation, at the same time, Council of Ministers resolutions No. 2020/1969 (VII.1.), 2013/1974 (IV.2.), 2021/1974 (V.6.), 2039/1974 (XII.7.), 2013/1975 (VI.25.), 2014/1975 (VI.25.), 2019/1975 (VII.21.), 2023/1977 (IX.10.), and 2004/1978 (I.19.) become void, and cabinet resolution No. 1010/1967 (V.28.) is amended according to paragraph 4.i. of the present resolution.

2153
CSO: 2502

result, the previously recognized wheat variety named GK Tiszataj was born. It has numerous advantageous characteristics: it germinates very early, its stalk is firm and flexible,, its 1,000-grain weight is 40 to 42 grams, and its hectoliter weight is 80 to 82 kilos. Its resistance to the winter is reliable, it withstands dryness well, shows little susceptibility to disease, grows abundantly, has a 16-percent protein content instead of the average 14 percent, and its flour is of excellent A/2 quality, thus making it suitable for the improvement of weaker milling products. Its popularity is evidenced by the fact that it is grown in the lowlands counties on almost 30,000 hectares. The experts say that this wheat has a future since a good-quality outstanding wheat brings a better price on the world market.

Another promising variety is the GK Szeged, which has performed well for years in national experiments; it is being tested on 110 farms and the growing of its seed has been started this year. The unanimous opinion is that it can become the wheat variety of the future. This was also proven by experiments on small plots. Because of its biological potential, its crop yield can average 100 quintals per hectare. This was also partly proven by large-scale farming practice, as the GK Szeged produced more than 70 quintals per hectare last year in the Guardian of Peace Producer's Cooperative of Lippo. The variety encompasses all the characteristics needed for intensive cultivation. Its stalk firmness is excellent and it shows little susceptibility to brown rot.

Wheat Varieties of the Future

Among the soft wheats, the GK Hajnal promises to be good. This variety can become a serious competitor to the Yugoslav Sava and the Italian Libellula wheats. In the small-plot experiments, the Danko has performed well, and so did the latest varieties, the Tarjan, the Csongor, and the Bank. If they also show their good qualities in public cultivation, they can become the wheat varieties of the future. In addition, we cannot, of course, give up our valuable seedgrain imports. In order to be able to progress more rapidly--and the growers of Szeged admit it, too--we cannot do without the experiences of other countries.

Unfortunately, we began to concern ourselves with the growing of intensive wheat varieties later than our neighbors. Thus without the Rana I, Rana II, Rana III, and Partizanka Yugoslav wheat varieties, today we could still not reach any outstanding results in wheat cultivation. A difficult situation dictates that domestic growers make up for the lag and work even harder to supply the large agricultural farms with wheat varities which truly meet modern requirements instead of varieties with long stalks and small yields.

Every basis to achieve this exists, as we learned at Szeged. Not only are the growers working hard to prepare the new varieties, but they are also working out the agrotechnique to be used. They are carrying out experiments by reducing sowing density to see, besides increasing the crop average, to what extent the danger of brown-rot contamination can be reduced. The researchers

REGULATIONS ON NONGOVERNMENT PAID FOREIGN TRAVEL OF SCIENTISTS

Budapest AKADEMIAI KOZLONY in Hungarian 5 Jul 78 pp 101-102

[Text] Regulation No 4/1978 (AKADEMIAI KOZLONY 8) of the secretary general of the Hungarian Academy of Sciences on foreign travel for scientific purposes made at the expense of the scientific workers themselves.

I am issuing the regulation below in agreement with the Ministry of Finance on foreign travel made at the expense of scientific workers themselves in the interests of expanding scientific and professional knowledge.

1.(1) In accord with the grounds in the regulation, able to travel are

--Regular and corresponding members of MTA [Hungarian Academy of Sciences] and its doctors and candidates in the sciences, as well as scholarship holders and corresponding candidates;

--Research institute workers including chief managers, managers and deputies, chief scientific department leaders, scientific department leaders and foremen, scientific advisors, and major colleagues, colleagues and junior colleagues;

--Research department workers active in nonresearch organs, who have been involved in scientific research work for at least 1 year.

1.(2) In addition to the grounds in section (1), the Academy offers aid to workers in non-academic positions for research, if their stay abroad is related to academic interests.

1.(3) The regulation must be applied to trips when workers, designated in sections (1) and (2), are traveling abroad as private individuals (not on official missions and so forth), and their travel is related to academic interests.

5.(1) The traveler will apply directly to the Ministry of Interior to request a passport.

5.(2) The Main Division of International Relations of the Central Office will furnish the visa necessary for foreign travel at the traveler's expense.

6.(1) The traveler will present his request for permission for a currency allotment to the Hungarian National Bank.

6.(2) Travelers abroad can buy currency at their own expense in accord with the following:

--MTA regular and corresponding members up to full first class daily costs and housing expenses for the trip abroad;

--Doctors and candidates in the sciences, senior scientific colleagues, and scientific colleagues and junior colleagues up to full second class daily costs and housing expenses;

--Other scientific workers up to the currency norms established for tourist trips.

6.(3) In the case of specific invitations where the expenses of the foreign stay are covered by the inviting party, the traveler can buy currency corresponding to the currency allotment established for guest journeys into countries with convertible currency accounts.

6.(4) In addition to the currency allotment which can be claimed for housing expenses, currency can also be claimed in accord with the decisions in sections (6) and (7) for congresses, conferences and other types of participation, as well as for fuel purchases.

6.(5) A currency allotment can be claimed for a participation fee if the traveler verifies the amount of the participation fee with an official report which establishes whether the fee includes payment for housing or food expenses. If the participation fee includes residency expenses (housing and food), the currency allotment which can be claimed for the purchase is correspondingly reduced.

6.(6) A currency allotment can be requested for fuel purchases according to the norms established by the Hungarian National Bank in relations with convertible currency settlements, and according to need in relations with ruble settlements.

7.(1) A currency allotment can be used exclusively in countries of convertible currency settlements in proportion to the number of actual days of stay abroad.

SPACEBORNE DETECTION USES, CAPABILITIES DESCRIBED

Warsaw ZOLNIERZ WOLNOSCI in Polish 4 Jun 78 p 4

[Interview with Col Dr Eng Wladyslaw Kolosowski, Military Technical Academy by Capt Eng Bronislaw Hynowski: "Space Technology--Spaceborne Detection"]

[Excerpts]

[QUESTION] What are the technical capabilities of spaceborne detection, that is, with what kind of detail and at how great a distance can an analysis of objects or environments be performed?

Col Kolosowski: Modern spaceborne detection is characterized by the high output and accuracy of gathered data as well as by the complexity of the research. Moreover, it is characterized by the great range and also the great speed with which the data is gathered and relayed.

One of the most important parameters deciding the information capacity of the photograph or display is its resolution. This is based on a series of factors. Here one can mention, among others: the resolution of the optical system; the resolution of the photosensitive material or of a detector of another type used to record information; the method of signal processing and visualization; as well as the contract effect between the designated objects and the background.

A very important achievement in recent years has been the mastery of the technical side of multi-spectral analysis. The multi-spectral technique allows for simulataneous photographing in several bands of the electromagnetic spectrum. Most often, multi-ojective still cameras, outfitted with an appropriate set of filters, are used for this purpose. These record pictures in the visible, near infra-red and ultra-violet light [spectra].

Along with the development of multi-spectrum photography, a design for spaceborne detection equipment based on radiometers, spectrometers and

POLISH COSMONAUT SELECTION PROCESS DESCRIBED

Warsaw SLOWO POWSZECHNE in Polish 28 Jun 78 p 3

[Interview with Col Dr Romuald Bloszczynski, Military Institute of Aviation Medicine by Stanislaw Remuszko]

[Text] What are the criteria for selecting cosmonaut candidates? What psycho-physical characteristics must they possess? We are discussing this subject with a scientist who has conducted special tests on a group of Polisc pilots, namely, Col Romuald Bloszczynski of the Military Institute of Aviation Medicine.

[Question] Doctor, perhaps you will begin by telling us about the beginning.

[Answer] We had selected a large group of scores of pilots from among military supersonic-aircraft personnel. All those in that group have had a great deal of professional experience and were in excellent health. Following preliminary tests at the Military Institute of Aviation Medicine, we reduced the group to about 20 persons and assigned them to aviation conditioning centers in Mazury and in Zakopane for 2 months of training, the purpose being to equalize the pilots' performance characteristics so as to establish a uniform comparative basis for the third selection stage.

After training in camps where medical and psychological tests were performed in parallel, there were only 12 candidates left. Those were subjected to a cycle of all-encompassing tests sequentially administered by teams of specialists. From final discussions and composite analyses there evolved a point list according to which four pilots were selected for additional testing in the Soviet Union. The results of those tests were favorable: All four were recognized as being completely fit for space travel. Our government decided to assign two of them to the basic training of cosmonauts, as official representatives of Poland.

[Question] The evaluation by Soviet specialists with many years of experience in cosmonaut selection thus agrees with your evaluation, which must be a pleasing confirmation of the correctness of the test programs and of the

xerted? The man who attains these results with less effort is obviously the better one, inasmuch as he retains a larger reserve capacity for coping with extreme circumstances.

[Question] What were the I.Q. scores of our cosmonauts?

[Answer] Excellent. We applied, among others, the Wexler norm adapted to the overall Polish population. The results fell within the 130 to 135 range, the norm for an adult person being 100. Scores like those of the cosmonauts are reached by hardly a few percent of society.

[Question] Stanislaw Lem has described, surely on the basis of authentic scientific experiments, some prodigious responses of the psyche and tricks of fantasy of a man living for long periods of time alone in the cosmic vacuum. Will you permit me, in conclusion, to ask how our pilots are protected against this.

[Answer] Of course, these so-called eidetic responses of the imagination under space flight conditions are known to scientists. One of the Russians reports, for instance, how after having been in orbit for a long time he suddenly heard the bark of a dog and the cry of a child, whereupon he saw ...indeed!...the child's mother calming it. Responses of this kind are a consequence of mainly two circumstances: 1) sensory deprivation, i.e., limitation of the amount of external stimuli, and 2) social isolation (one lives here, after all, for many weeks in the company of one or, at most, two other persons). Such illusions are also fostered by the space limitation inside a craft, the lack of domestic comfort, the state of weightlessness, etc.

One copes with it by various methods and with various means. We inform the candidates, for instance, about likely perturbations; one suffers much less when the mechanism and the causes of perturbations are known. At the same time, as the art of space travel is progressing, we note a trend toward an organized leisure time in which the pilot engages in some interesting as well as relazing activity. For diversion during flight there are established regular communication links with family and colleagues, even chess tournaments were arranged across the distance from Earth to satellite in orbit.

For this very purpose, the pilots of "Salyut" have been equipped with magnetic videotapes and a monitor. Like the other pilots, our compatriot took with him film and music casettes with performances of his favorite artists. The time in orbit will certainly not be boring.

[Slowo Powszechne] Thank you very much for talking to us.

2415
CSO: 2602

Their high sensitivity and, even more, their low inertia facilitate the reception of very short (nanosecond) signals, which makes many new applications feasible. Such HgCdTe devices can detect radiation within 10 um band, i.e., within the so-called atmospheric window, because radiation within this band is not absorbed by clouds and other gases. The materials can also be used for the construction of semiconductor masers (infrared) or halotrons. We expect the HgCdTe-type semiconductors produced under zero-gravity conditions to be crystallographically more homogeneous and more nearly perfect than those produced on Earth.

"Syrena" is the name given to the Polish technological experiment to be performed on board the "Salyut-6." It is one of the experiments which the Institute of Physics proposed for the INTERKOSMOS program (at the First Conference on Problems of Space Technology in May 1977 in Moscow). It is noteworthy that this will be the first technological experiment in history to be performed with such a ternary compound in outer space. It will be performed in collaboration with the Institute of Space Research at the USSR Academy of Sciences in Moscow.

The rapid progress in space technology brings us closer to the era when various materials for industrial use will be produced in orbit around the Earth. In the opinion of some experts, tons of various materials will be produced in outer space by the end of this century. All this indicates that we will soon witness the birth of a new branch of industry, namely an industry set up for the production of new materials with better and better properties. These materials will, in turn, contribute to further progress in science and engineering.

The "Syrena" experiment on board the "Salyut-6" is the contribution of Polish scientists to hastening this progress.

Space Medicine, Psychology

Warsaw ZOLNIERZ WOLNOSCI in Polish 28 Jun 78 pp 3, 5

[Article by Col Stanislaw Baranski, commandant, Military Institute of Aviation Medicine]

[Text] What will the Pole be doing in orbit? Zolnierz Wolnosci addressed this question to Col Stanislaw Baranski, commandant of the Military Institute of Aviation Medicine, professor, doctor and a prominent expert in the field of aerospace medicine, also a coorganizer of preparations for the space flight to be undertaken by the first Polish cosmonaut.

We have prepared for our cosmonaut a research and test program which is rather broad in scope and scientifically important. It covers as many as 12 subject matters, including 9 in the field of medicine, physiology, and psychology, 2 in the field of physics and space technology, and 1 in the field of earth science or, more precisely in photography of the Polish territory for various uses in science and the national economy.

moving track on the "Salyut-6." The most important experiment in the field of space medicine, now performed by us jointly with the Soviet Union, includes testing the cosmonauts before launching as well as during flight and during landing; it covers the performance of the cardiovascular and the respiratory system under dynamic conditions. We have adapted for this an apparatus called "physiotest," which had been developed at the Military Institute of Aviation Medicine and which can simultaneously record parameters of seven states of a human organism under dynamic conditions. The results of these tests can be displayed on an oscillograph screen, recorded on a magnet tape, indicated digitally on a luminous panel, and transmitted to a computer for a precise analysis of changes in the cardiovascular and the respiratory system. The apparatus can be connected to the moving track and to a cyclergometer, for authentic regulation of the heart activity, the track speed, the inclination angle, etc. This "physiotest" will be used for prelaunch testing of the Soviet and Polish cosmonaut, we will also use it for postlanding tests and during the debriefing period.

The subsequent two experiments we will perform jointly with Soviet specialists, as a continuation of Soviet research begun earlier. The object of one of them is to test the responses of man's constitution to the use of "Czybis" decompensating suits in the state of weightlessness. The other experiment deals with determining the blood distribution under zero-gravity conditions. These two items are interrelated and they constitute a certain entity within the continuous test series whose aim is solving a problem of great importance to the future of cosmonautics, namely, the preparation of a man for long space flights.

Jointly with the Soviet Union and Czechoslovakia, we will study the heat transfer in an organism under zero-gravity conditions. The absence of air movement may inhibit heat transfer in some parts of the human body. Without dwelling too long on this subject, let me only point out that we have undertaken an experiment with the use of temperature-holding sensors. Another Soviet-Polish-Czechoslovak experiment in the field of space medicine concerns oxygen processing under zero-gravity conditions. Oxygen depletion is measured here polarographically.

In the field of space psychology we have developed, jointly with the Soviet Union, a "log book" which we hope will give us an objective evaluation of the effects of various factors on man's performance during a long orbital flight. The data recorded in this "diary" will include, among others, fitness for activities under zero-gravity conditions, ability to communicate with other members of the crew, processes involved in visual perception, work and rest rhythms, use of medications and their effect on the feeling or well-being, etc. In the field of psychology we will also perform tests dealing with recreation. On the basis of research on individual interests and tastes of cosmonaut's, Col Romuald Bloszczynski (director of the Department of Psychophysiology at the Military Institute of Aviation Medicine) has prepared a 4-hour recreation program and put it on magnetic video tape. This program, when followed during flight, will make it possible to evaluate the effect of

BIOGRAPHICAL DATA ON COSMONAUT, ALTERNATE GIVEN

Warsaw PERSPEKTYWY in Polish No 26, 30 Jun 78 pp 4, 5

[Article: "A Pole in Outer Space--Miroslaw Hermaszewski"]

[Text] Diplomate Maj Miroslaw Hermaszewski is a 37-year-old military fighter pilot. He has accumulated 1,480 flight hours, including 1,250 on jet and supersonic aircraft. He is a graduate of the General Staff Academy [ASG]. Prior to his selection as a cosmonaut candidate, Major Hermaszewski commanded a fighter plane regiment.

He belongs to that generation of young Poles who were trained and educated in People's Poland, but his earliest childhood memories are linked with the war. He was born on 15 September 1941, the seventh child of Roman and Kamilia Hermaszewski who worked a 3-hectare farm in Lipnik, located on the outer edge of the former Radziwill estate. He was 2 years old when in the fall of 1943 his father was killed by the fascists. After the war, in the spring of 1946, the Hermaszewski family relocated to the Western territories, settling in Wolow, in the voivodship of Wroclaw.

The future cosmonaut was interested in aviation and airplanes since early childhood. Encouraging this was his older brother, Wladyslaw Hermaszewski, who started to appear in an air force uniform in the family home while on leave when 7-year-old Mirek was just starting primary school in Wolow. At that time his brother was attending the Air Force Officers School [OSL] in Deblin. Today, Wladyslaw Hermaszewski is a graduate of the ASG and a doctor of military science. The third Hermaszewski brother, Boguslaw, also is an air force officer, and our cosmonaut's wife, Emilia, worked for the LOT [Polish Air Lines].

Along with his studies in primary school and later on in a general studies secondary school, the future cosmonaut traversed the normal route of preparations leading young people to the pilot profession: reading aviation books and magazines, tinkering with and building model planes in the aviation model shop classes held in Brzeg Dolny by the League of Soldier's Friends [LPZ] (today: the National Defense League [LOK], basic glider training at the Wroclaw Aeroclub airport, and vacations at the aviation training

Upon completing the ASG, Diplomate Captain and Pilot Hermaszewski was in turn a regiment navigator in his parent unit to which he returned, and then a squadron commander in a fighter plane unit of the Home Air Defense Forces (WOPK] on the Coast. These were followed by new garrisons and functions of increasing responsibility. He was promoted to major on 6 January 1975, and 3 months later he assumed command of a fighter plane regiment. He commanded the regiment for over a year with success and distinction after which he was ordered to report to the commander of the Military Institute of Aviation Medicine [WIML] in Warsaw. Here, from the lips of the commander, Col Stanislaw Baranski, Major Hermaszewski and several dozen other pilots who received similar orders learned that the first Polish cosmonauts were to be selected from their group.

The selection process was long and complicated. It included an analysis of each candidate's aviation-medical documentation, specific tests and interviews, psychological tests and dozens of tests on instruments and mechanisms to determine physiological and physical capabilities. In the meantime, Major Hermaszewski attracted attention as an excellent candidate on all accounts. He distinguished himself also during the following state at the preparatory camp of the Military Conditioning and Training Center in Mragow.

Lt Col Zenon Jankowski turned out to be a second ace here; in many areas of sport, both of them outperformed younger candidates. Additional medical tests, interviews, tests and questionnaires followed. Ten of the best, most competent candidates traveled to the mountains to Gronik (near Zakopane) in order to get into top psychophysical shape, a continous requirement for cosmonauts. Short physical height, however, is no longer required. Today, space ship dimensions are such that the 170-cm required height limit which was enforced during Gagarin's time and later is no longer obligatory. Major Hermaszewski is 182 cm tall and weighs 76 kg, which today no longer represents a barrier for a cosmonaut candidate.

At the end of October 1976, a group of Soviet scientists from Gwiezdny Miasteczek visited Poland. After reviewing test results and preparations and after conducting still more tests, on the proposal of Soviet specialists, four Poles traveled to the Cosmonaut Training Center in Gwiezdny. Here they undertook an intensive preparatory course known in outline from many writeups and reports. They studied astrophysics and astronavigation, space medicine and biology, physics and geology, chemistry and meteorology, photography and many other areas of technology--in all, over 40 subjects. Along with this there were the principles of building and servicing space flight equipment and, finally, simulated flight exercises conducted on models of "Soyuz" and "Salyut." All four candidates were qualified as meeting requirements. But for the present time the intercosmos program called for the selection of two Polish cosmonauts. Upon their return from Gwiezdny to Poland, the final decision was made: Major Hermaszewski and Col Jankowski.

colonel. That same year Colonel Jankowski, participating in the "Tarcza 76" Warsaw Pact exercises, professionally commanded a squad of variable-wing-geometry airplanes.

Shortly after his return from the exercises, he was ordered to report to the commander of the WIML. Together with several dozen other air force officers, Jankowski began a program of tests and preparations the aim of which was to select candidates for the first Polish astronauts. In this group were pilots in the 27 to 38 age bracket; Jankowski was among the oldest. It turned out that with regard to physical and psychophysical condition, which is an essential condition--although of course not the only one--that a candidate must meet, Jankowski was among the top. As a result of many complicated tests and criteria, Jankowski was sent to Gwiezdny Miasteczek. It was a productive and very strenuous trip. The Polish candidates were well prepared for a joint Soviet-Polish space expedition. During the training period, Jankowski and Hermaszewski became especially friendly with and close to Soviet cosmonaut Piotr Klimuk, twice Hero of the Soviet Union. Klimut had flown in outer space two times--in 1973 and 1975--when during experiments from the Salyut 4 station he spent 63 days in orbit. The Polish cosmonauts benefited greatly from his experience and knowledge and they became sincere friends.

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